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ABSTRACT

A construction guide is presented for play and recreational equipment for individual use and child care center and camp use. The bulk of the booklet gives detailed instructions for specific kinds of equipment, such as teepees, household appliances, bean bag boards, outdoor playground equipment, doll houses, bird houses, boats, puppets, and chairs. Costs are included in the directions. Woodworking suggestions are also offered along with details for connectors. Photographs and diagrams supplement the directions. (LH)

CHILDREN'S THINGS

a construction guide for play and recreational equipment for parents, teachers, child care centers and camps.

Prepared by:

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Woodworking Suggestions

Lumber sizes are nominal except in the case of plywood which is exact. Nominal means what they are called but not what they actually measure. For example; a nominal two by four board actually measures an inch and five-eighths by three and five-eighth inches. Now there are new standards being set by the lumber industry which will reduce those actual sizes further. In general, lumber will measure smaller than the nominal size. That is important to remember when you purchase fasteners. Nails and screws are exactly the size named.

It is a good practice to sandpaper rough edges on all wood pieces before they are fastened together. That eliminates the chance of splinters in hands and makes painting much easier.

Each piece of wood should be glued in addition to nailing. This should be done on all areas that meet as you assemble the parts. Any good woodworking glue can be used.

Non-toxic paint should be used. There isn't much danger of a child eating paint in a well supervised center, but it's so easy to get the lead free paint that the ease of mind is worth the difference.

Use a liquid detergent full strength for cleaning brushes when the paint is still wet. Detergent is not flammable, and the odor isn't objectionable.

The use of a cement coated box nail is recommended. Drive the heads flush and they will take paint well. The holding power and reduced wood splitting makes them worth using even though they require a bit more care in driving.

When bolts are used (as in hinges) don't let the ends project. Either get exact sizes or cut the excess and then tap the ends smooth. That eliminates the danger of people being injured and keeps the nuts from working off.

When cutting plywood with a hand saw, cut down on the good side so that splinters and roughness show on the poor side which will be on the inside of the finished furniture. Electric saber saws cut in the up direction, so use them with the poor side of the plywood on top.

Most plywood will show hollow spots when cut. Place the piece with the hollow edge up and run some glue into the places where the laminations are missing. That may not fill the holes completely, but it will strengthen the other layers and hold fasteners better.

You can do a very good job with simple hand tools, but the more power tools you have the easier and faster you can finish.

Plywood sheets are large and awkward to handle. Most of these designs use four foot sections and the lumber yard will usually be agreeable to cutting the sheets in half for you.

When cutting large sheets of plywood with hand tools you should have help in holding it. Supports are needed; tables, or boxes.

The plans call for the use of pine for one inch stock instead of spruce since the pine nails and saws much easier and will be strong enough in all cases.

Select a straight piece of one by two about four and one half feet long to use for marking across sheets.

Use a gloss enamel or semi-gloss paint to provide a hard and washable finish.

Paint dealers often have colors that were either discontinued or mixed in error. The quality is unimpaired, but it is usually a dead item for them and they are usually willing to sell for reduced prices. If you can locate the type of paint in a color you like, you can save by getting that.

Carpeting for the climbing bars and the puppet theater can be the rubber backed type. Samples of discontinued colors can be gotten free or at reduced prices. Cement them in place for safety and to reduce noise.

Form follows function:

A functional, safe and attractive article of furniture can be produced by an amateur woodworker using basic hand tools. Remove all sharp edges from boards with sandpaper. Drive all nails flush and watch for points going through. Work slowly and carefully, measuring twice and cutting once. Enjoy the experience and produce an honest article for use in your center.

Best wishes from Stone Mountain.

President: Vivian E. Mars.

Vice-president: Ellen J. Castaldini Jackie Spitler

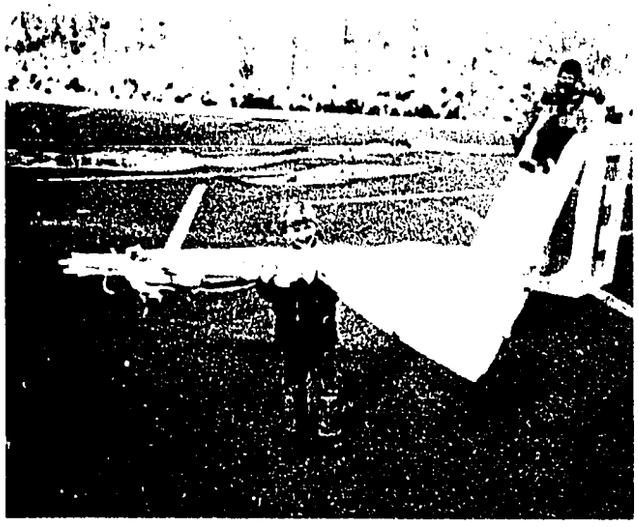
Secretary: Mary Lamb Jerry Winter

Treasurer: Roger K. Cobb Bettye Crawford

The Teepee

The Teepee set up:

The Teepee folded:



This is a popular piece of play equipment which is easy to make and inexpensive.

The teepee is light and can be carried with little effort.

The size and portability of the teepee make it useable indoors and out.

When folded the teepee easily fits in an average height closet.

The muslin material takes magic marker and poster paint well and can be easily decorated with bright colors and indian themes.

Approximate cost: $4.63

The Teepee (continued)

Material list and approximate cost:

6 yards muslin one yard wide	$2.34
3 - 14' of 1" X 2" #2 pine	2.10
18 upholstery tacks	.19
	$4.63

Tools needed:

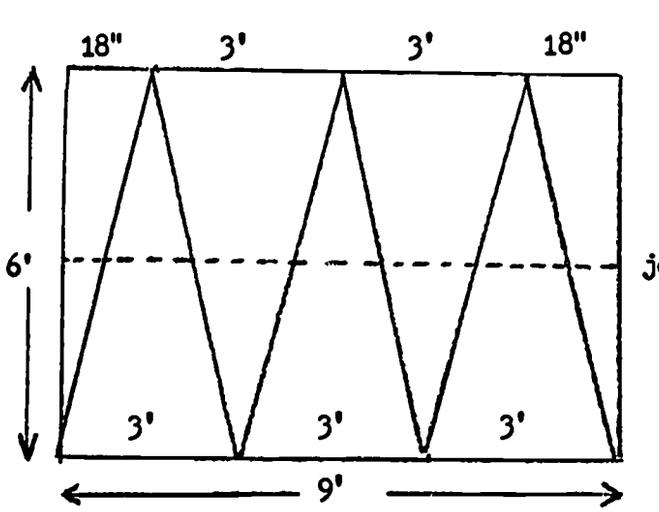
scissors
sewing machine
cross cut saw
drill with 3/8 bit
plane to taper posts

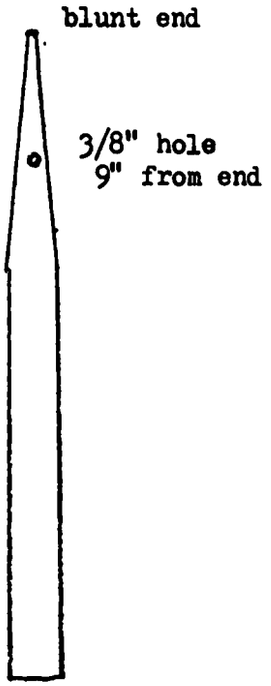
Parts to be cut from the above materials:

6 - 7' lengths of 1" X 2" with one tapered end and 3/8" hole
5 triangles with 3' base and 6' height from muslin
2 right triangles with 18" base and 6' height from muslin
1 - 3' piece of strong cord from the drawer

Directions:

Cut muslin to two 3 yard lengths and stitch together to form one six foot by ~~eighteen~~ NINE foot piece.
Cut into sections as diagramed below..
Stitch triangles together matching wide part to wide and points to points.. keep all seams inside.. Stitch to the base but leave nine inches unsewn at the points.
Stitch the two narrow pieces together only half way to the base (to the seam). That opening is the doorway.
Cut the two fourteen foot pieces of 1" X 2" pine into six 7' pieces.
Drill the hole nine inches from one end.. Plane those ends about sixteen inches down to the end, but leave the ends blunt for safety.
Run the string through the holes and knot it leaving a good amount of slack to adjust later.
Slip the cover over the poles with the top toward the cord end of the poles.
Open the tent and adjust the string tightness with legs flared.
Tack at the bottom, top and middle matching the seams with the poles..





The Washer - Dryer

The Washer - Dryer in use:

This is a very easy piece of furniture to build, and the cost for material is low.

This article does not fold for storage, but it has castors for rolling and has space inside for the storage of other things. The ironing board fits inside it.

The washer - dryer set is another good piece of equipment for imaginative play. The design is simply that of a box with two doors and some decorations.

The ironing board is made from material left over from the washer - dryer set. There is no additional cost for its production.

We posed these three children on the board to demonstrate its strength.

Material cost: $18.06

The Washer-Dryer (continued)

Material list and approximate cost:

1 - 4' X 8' X ½" AC plywood	$6.71
1 - set of castors 1½"	2.30
2 - pairs 1½" light butts	.80
1 - roller cabinet catch	.55
4 - dozen 3/4" #7 wood screws	.80
1 - lb., 4d cement coat box nails	.30
1 - quart enamel undercoat	3.00
1 - quart enamel paint	3.00
6 - ounces wood glue	$ .60
	$18.06

Tools needed:

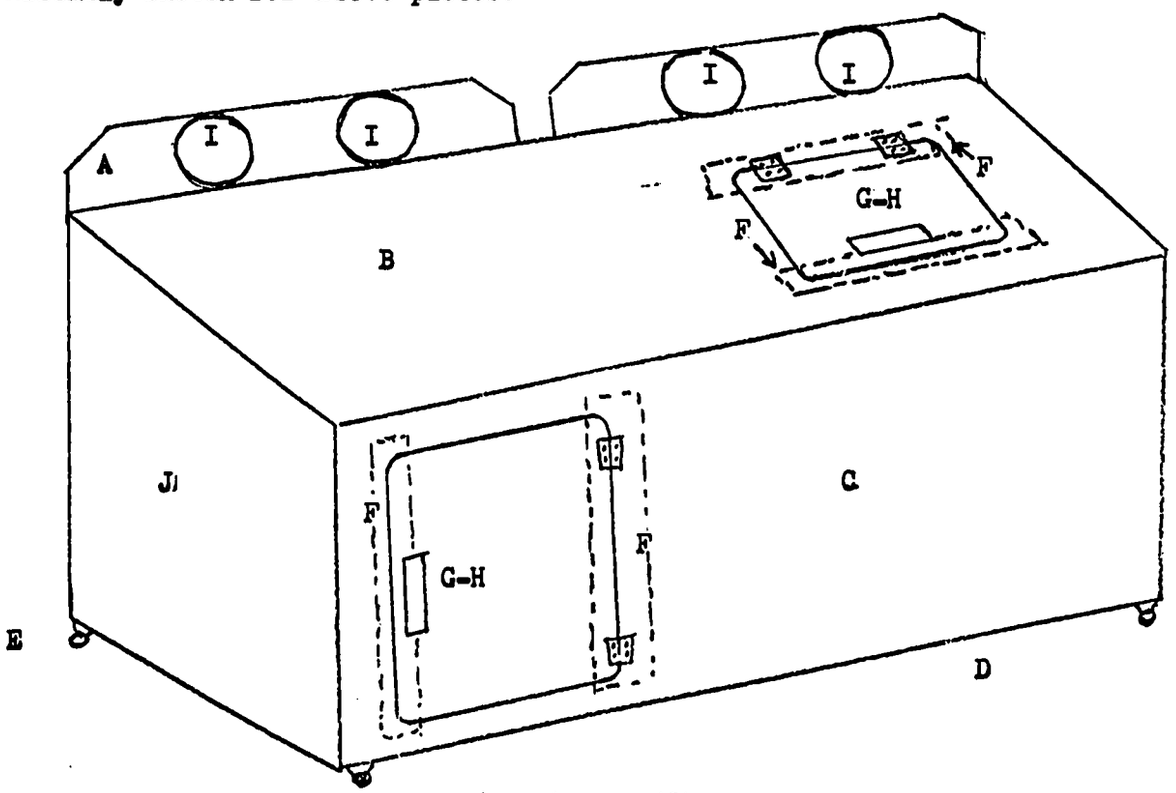
hammer
electric saber saw
screw driver
2" paint brush
sandpaper
ruler
brush cleaner

Parts to be cut from above materials:

1 - 22" X 34" X ½" plywood for back	A
1 - 16" X 34" X ½" for top	B
1 - 17½" X 34" X ½" for front	C
1 - 15½" X 34" X ½" for bottom	D
4 - 3" X 3" X ½" for castor plates under bottom	E
4 - 14" X 2" X ½" door stops	F
2 - 1" X 4" X ½" handle bases	G
2 - 1½" X 4" X ½" handles	H
4 - 3" discs for simulated control knobs	I
2 - 15½" X 17" X ½" sides	J

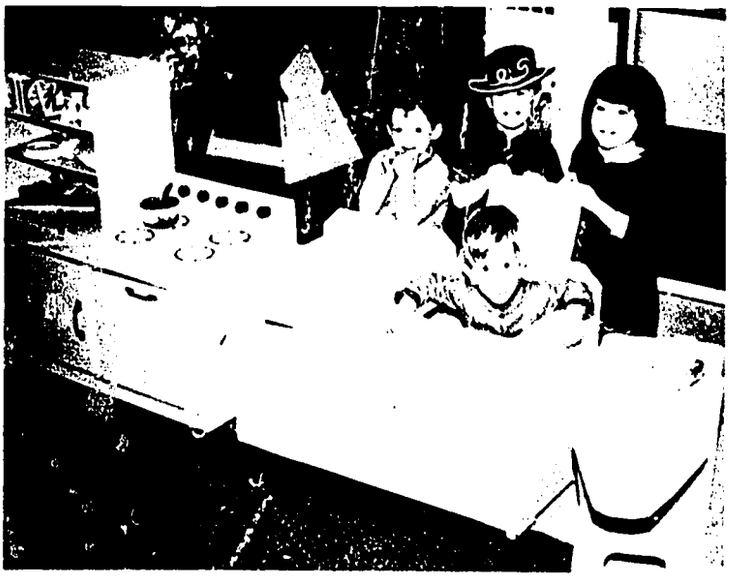
Doors are cut from top and front pieces.

Assembly sketch for above pieces:



The Ironing Board

The Ironing Board in use:



A good strong ironing board is really necessary in a center. This is a a popular play activity, possibly because the children can't be allowed to use a real iron.

We feel that the ironing board is a common appliance and should be made in the commercial form.

After discarding several commercial models which broke, we decided to try to design a strong one that could be made easily and cheaply.

The Ironing Board apart:

This ironing board is made from the left-over material from the washer-dryer set. It costs nothing but the labor to build.

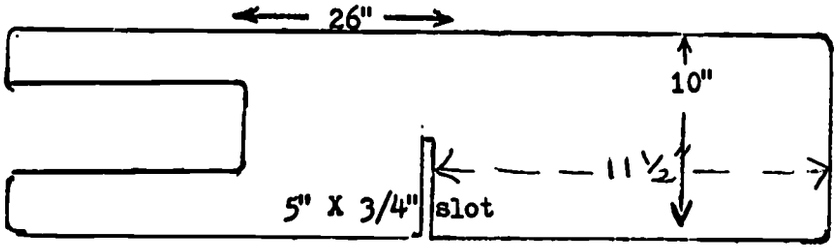
The Ironing Board (continued)

Material list and approximate cost:		Tools needed:
30" X 48" X ½" AC plywood	$3.00	electric saber saw
2 - ounces wood glue	.30	hammer
½ - lb. 4d cement box nails	.15	sandpaper
1 - pint enamel paint	$1.80	ruler
	$5.25	2" paint brush
		brush cleaner
or		
Leftover materials from washer-dryer:		same tools

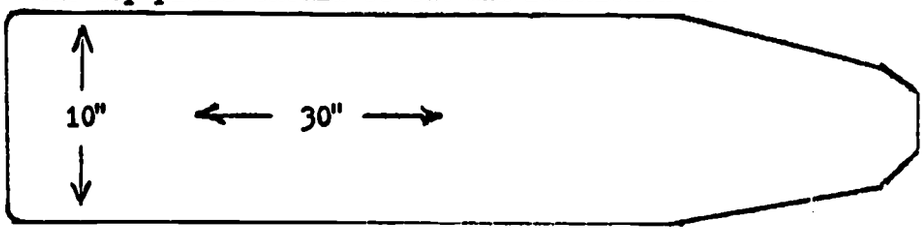
Parts to be cut from the above material:

1 - 10" X 30" X ½" tapered toward end
2 - 10" X 26" X ½" notched as shown
1 - 2" X 2" X 11" wedge block tapered as shown and cut from
4 - 9" X 4" X ½" blocks placed as steps, fastened and sawed.

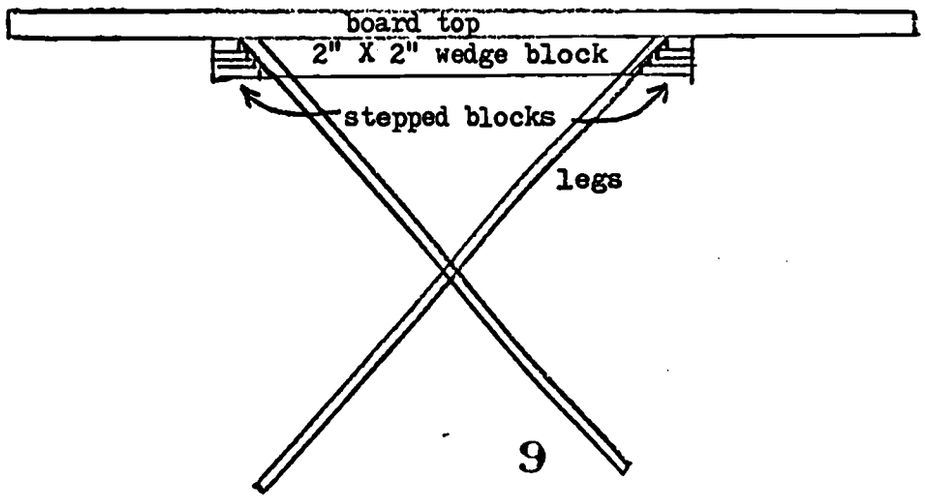
Two pieces should be cut resembling this:



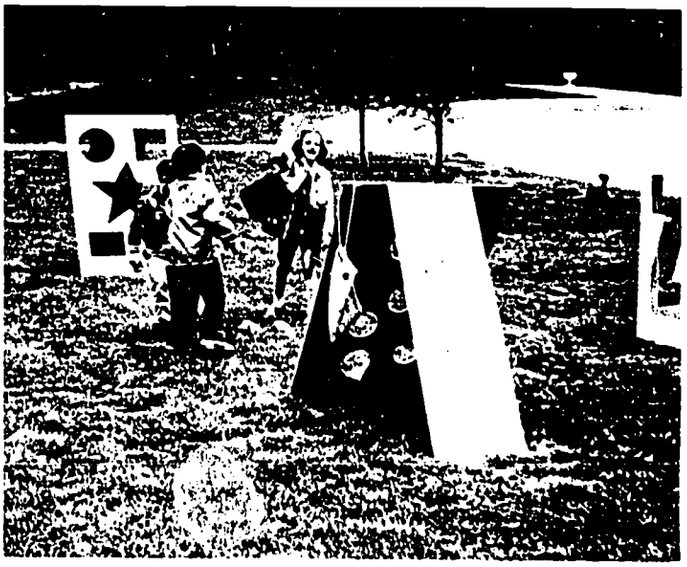
The top piece should be cut and fashioned so:



Side view:



The Bean Bag Boards



The bean bag boards are a good active outdoor activity. The children can learn to throw without having to chase a ball.

Cooperative play is encouraged by taking turns. One child stands at each board and throws the bags back to the other.

This is a very portable set since the total weight including bean bags is under fifteen pounds.

Any figures can be used for the cut outs. Make the openings large to unsure success in the throwing and to keep the wind from blowing the boards over.

The boards can be used as tents by simply placing a sheet or blanket over them.

These pieces should not be climbed on unless you go to a heavier plywood and metal hinges.

This is a good beginning piece because it is so easy to construct, and the materials are inexpensive.

Material cost: $7.98

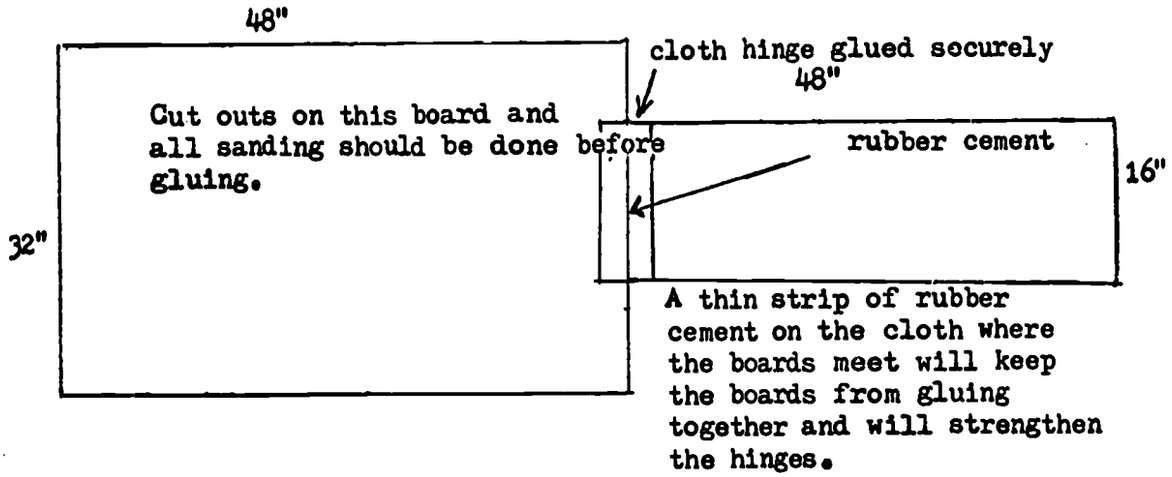
The Bean Bag Board (continued)

Material list and approximate cost:		Tools needed:
1 - 4' X 8' X ½" AC plywood	$4.00	electric saber saw
1 - yard sturdy denim	1.50	scissors
2 - ounces wood glue	.30	sandpaper
2 - pounds dried beans or peas	.38	sewing machine
1 - pint enamel paint	$1.80	2" paint brush
	$7.98	brush cleaner

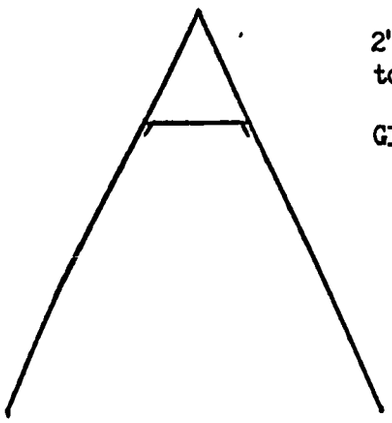
Pieces to be cut from the above material:

2 - 32" X 48" plywood
2 - 16" X 48" plywood
2 - 4" X 16" denim for hinges
2 - 2" X 12" denim for straps
1 - 24" X 36" denim for draw string carrying bag
Remaining denim for bean bags the size you wish.

Assembly sketch for boards:



Side view:



2" X 12" cloth strap, place one foot from top.

Glue one inch tab to boards.

The Outdoor Equipment

Playground in a Box

This consists of equipment for at least eight activities which revolve around sliding, climbing, balancing and swinging. There is enough play area to accomodate fifteen children who can be easily supervised by two adults.

All parts can be stored in two boxes which have wheels and handles. The set can then be easily rolled to storage. Set up time is ten to fifteen minutes by one person depending on their familiarity with the equipment.

Connections for the play pieces are our own design which you can easily make with basic tools.

The storage boxes are utilized for climbing in and out (developing body awareness.) They are also used as bases for the slides, ladders, balance beam and seesaw.

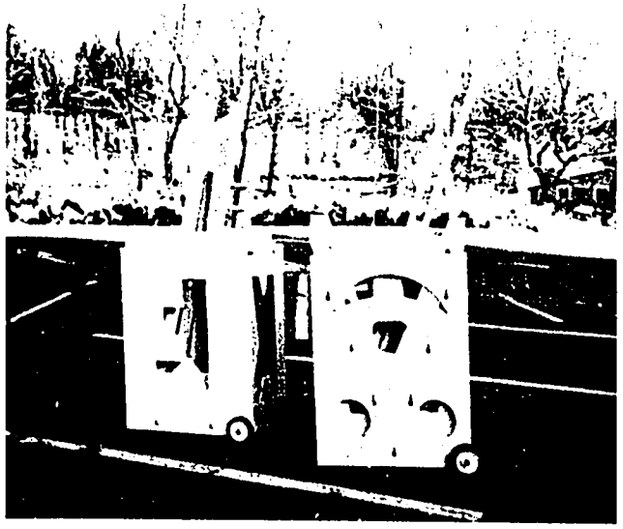
At our center we take the outdoor equipment in at night and don't find it too much of a chore. If you had a fenced yard it could be left up all season.

The boxes are four feet high which is the most efficient use of plywood panels.

Overall length is thirty-five feet.

The material list and plans are in two parts so that the first two boxes could be made without the others.

All work can be done with basic tools.



This shows the boxes inside each other and ladders and slides inside them also. They can now be tipped back and rolled to storage.

Material cost under $150

The Outdoor Equipment
The first two boxes and their attachments

Material needed and approximate cost:

3 - 4'X8'X 3/8" exterior plywood	$26.10
3 - 14'X2"X4" spruce	5.04
6 - 1"X36" hardwood dowels	2.40
1 - 16"X8'X$\frac{1}{4}$" tempered masonite	1.80
8 - $\frac{1}{4}$"X4$\frac{1}{2}$" lag bolts with washers	1.60
1 - gross 3/4" #6 flat head, cadmium plated screws	1.80
1 - pound 4d cement coated galvanized box nails	.30
2 - 5" lag bolts for wheel axles, diameter must match the particular wheels you get. Try for wheels from a discarded power lawn mower.	5.20
$\frac{1}{2}$ - pound 8d cement coated box nails	.15
8 - ounces wood glue	.80
1 - 8'X1"X2" #2 pine	.40
3 - 10'X1"X2" #2 pine	1.50
1 - 12'X1"X2" #2 pine	.60
1 - 18"X 1 3/8" round closet rod	.30
2 - quarts exterior enamel undercoat	6.00
2 - quarts exterior enamel	6.00
1 - small epoxy glue kit	$ 1.20
	$61.19

Tools needed:

hammer	router or table saw or contractor's saw
hand saw	to cut grooves for the slide
screwdriver	3" paint brush
1" drill	sandpaper
electric saber saw	wrench for lag bolts

Parts to be cut from above material:

2 - 36"X48"X3/8" plywood for large box sides
2 - 24"X48"X3/8" plywood for large box ends
1 - 25"X36"X3/8" plywood for large box top
8 - 48"X1"X2" pine nailers for both boxes (four each)
1 - 22$\frac{1}{2}$"X1"X2" pine nailers for large box - top to ends
1 - 22$\frac{1}{2}$"X2"X4" spruce nailer for large box - top to end for wheels
2 - 32"X1"X2" pine nailers for large box - top to sides
2 - 33"X48"X 3/8" sides for second (smaller) box
2 - 21"X48"X 3/8" ends for second box
2 - 19$\frac{1}{2}$"X1"X2" pine nailers for second box - ends to top
2 - 30"X1"X2" pine nailers for second box - sides to top
1 - 22"X33"X 3/8" plywood top for second box
12 -18"X1" dowels for ladder rungs
1 - 6'X2"X4" left rail for climbing ladder
1 - 5'X2"X4" right rail for climbing ladder
2 - 6'X2"X4" rails for horizontal ladder
2 - 7'X2"X4" rails for slide
1 - 16"X54"X$\frac{1}{4}$" masonite for slide
1 - 16"X14"X$\frac{1}{4}$" masonite for slide bottom
1 - 17"X2"X4" crossing support for slide bottom

The Outdoor Equipment
Boxes 3, four and five and their attachments

Material needed and approximate cost:

1 - 8'X1"X6" #2 pine	$ 1.28
4 - 4'X8'X 3/8" exterior plywood	34.80
1 - 10'X2"X6" spruce	2.00
1 - 12'X2"X6" spruce	2.40
7 - 4'X 1 3/8" round closet rod	5.60
1 - 8'X1"X2" # 2 pine	.40
2 - 10'X1"X2" # 2 pine	1.00
4 - 12'X1"X2" # 2 pine	2.40
22- $\frac{1}{4}$"X4$\frac{1}{2}$" lag bolts with washers	4.40
1 - 8 ounces wood glue	.80
1 - gross 3/4"X#6 galvanized flat head screws	1.80
1 - pair 6" wheels	5.20
1 - pound 4d ement coated box nails	.30
1 - 50 feet $\frac{1}{4}$" rope for swings	2.00
6 - 10d nails for see saw cleats (box nails)	.10
2 - quarts exterior enamel undercoat	6.00
2 - quarts exterior enamel	$ 6.00
	$76.48

Tools needed:

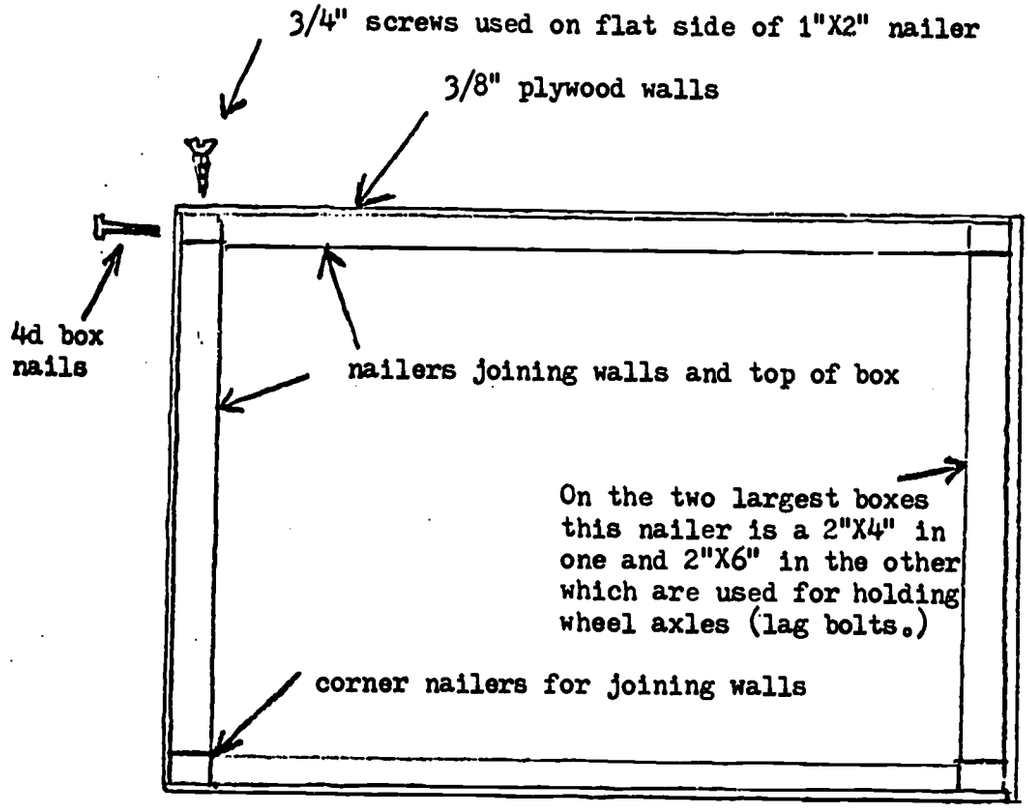
The same tools that are listed for the first set of boxes except that you will not need a tool to cut grooves.

Parts to be cut from the above materials:

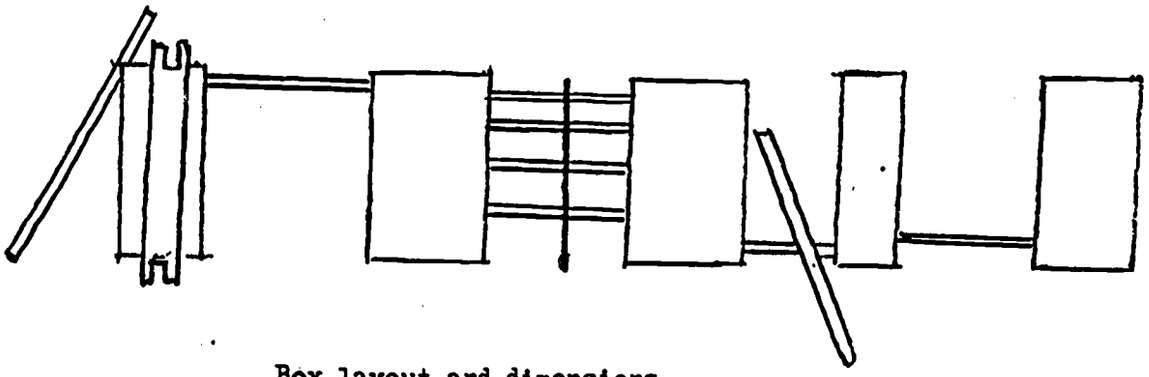
2 - 18"X48"X3/8" ends for smallest box
2 - 30"X48"X3/8" sides for smallest box
1 - 19"X30"X3/8" top for smallest box
4 - 48"X1"X2" nailers for sides of smallest box
2 - 16"X1"X2" nailers for ends to top
2 - 27"X1"X2" nailers for sides to top
2 - 48"X1"X6" for pyramid bars support
1 - 12" triangle of scrap 3/8" plywood for cleat on above support
1 - 3'X2"X6" see-saw support
1 - 8'X2"X6" see-saw
1 - 8'X2"X6" balance beam
2 - 2"X2"X5$\frac{1}{4}$" cleats for see-saw
1 - 22$\frac{1}{2}$"X2"X6" nailer (ends to top) for wheel end of large box

The largest and middle boxes are made following directions in the plans for the first two boxes except for the last piece in the list above.

The Outdoor Equipment



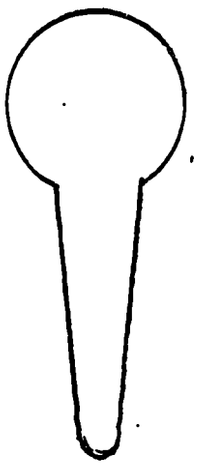
The above view is looking into a box from the open end which is on the ground when the boxes are in use.



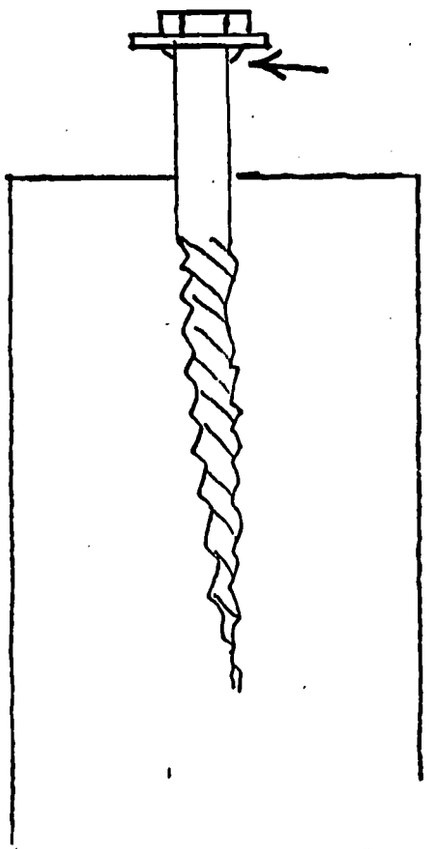
Box layout and dimensions

#1	#2	#3	#4	#5
22"X33"X48"	25"X36"X48"	25"X36"X48"	19"X30"X48"	22"X33"X48"

Details of Connectors



Drill a one inch hole after checking to see that the lag bolt heads are properly spaced. Use a saber saw to cut down two inches from the center of the hole. Shape with a taper as shown to allow bolt shanks to drop easily to the bottom of the hole.

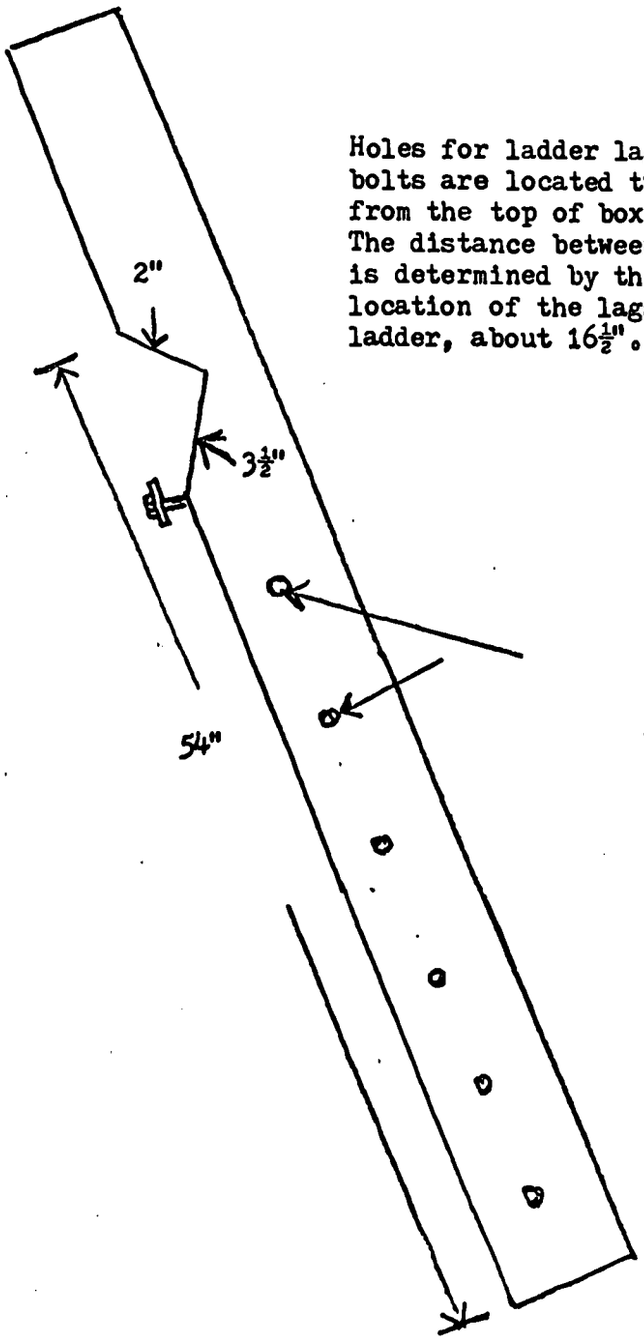


This sketch shows the lag bolt with the washer fastened to the head. We had the first ones welded for us but have lately tried epoxy cement applied very liberally. The cement has seemed to work as well as the welding and is less expensive.

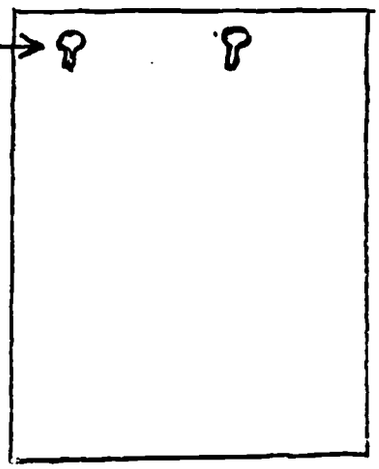
Holes for the bolts should be pre-drilled to keep the wood from splitting. Use a $\frac{1}{4}$" drill bit and squeeze glue into the hole before inserting the bolt. The glue helps to hold the bolt in and strengthens the wood.

The bolts should protrude about one inch overall leaving about five-eighths between the wood and the washer.

Details of Ladder for Slide



Holes for ladder lag bolts are located two inches from the top of box #one. The distance between them is determined by the exact location of the lags in the ladder, about 16½".

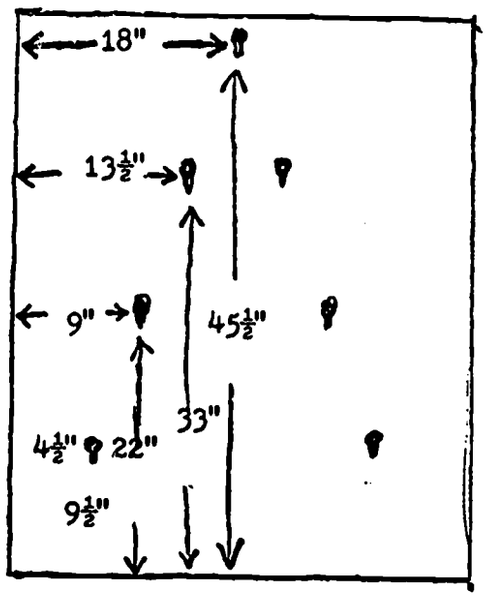


One inch dowels are placed in holes drilled completely through the side rails. These dowels are pinned in place by nails driven tinto the rail from the bottom.

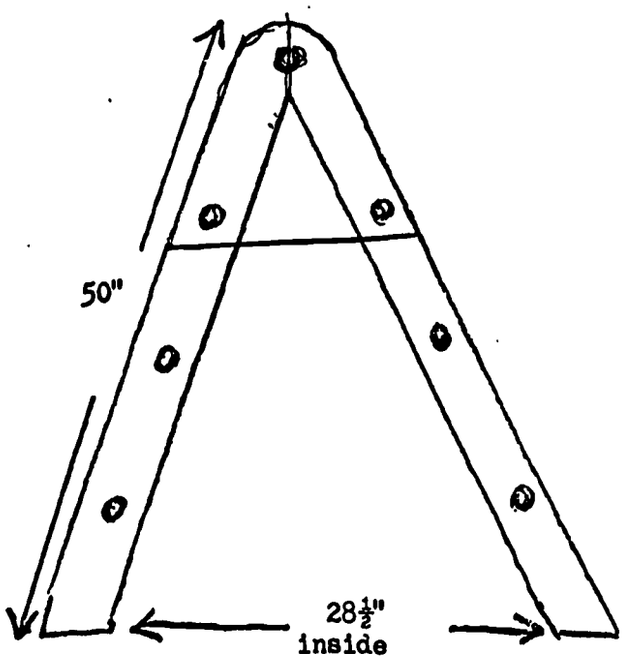
The left rail (facing the ladder as it will be used) is six feet long. The right rail is only five feet long. The longer rail is a safety measure in directing the children toward the rails of the slide.

Dowels are started six inches from the ground and continue with six inch spacing leaving a final six inch step onto the top of the box.

Details of the Climbing Bars



The second and third boxes have this hole arrangement on the sides that face each other.



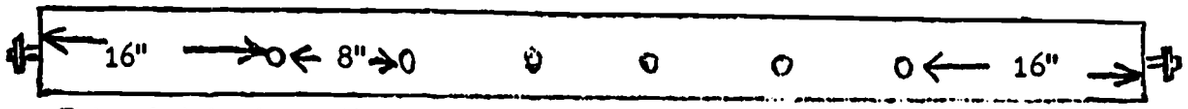
This is the spacer and support piece for the pyramid bars. The holes are two inches in diameter.

There are two pieces of 1"X6" cut to the size shown. They are joined by a triangular piece of 3/8" plywood using 3/4" flat head screws. The piece should be assembled before the holes are drilled. Align holes by holding the assembled piece against box which has had holes cut. Locate centers for 2" holes by marking through box with a pencil.

The Horizontal Ladder

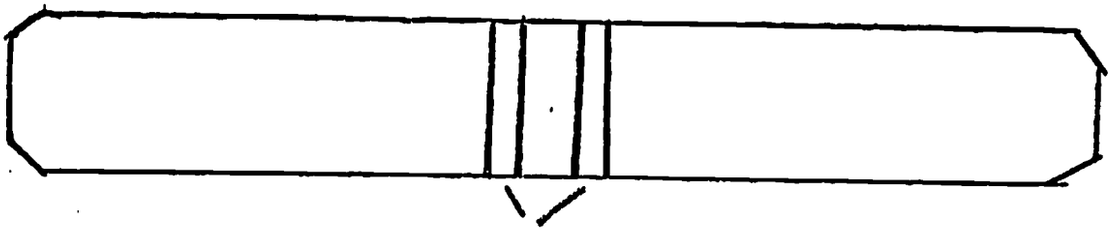
The See-saw

The Balance Beam

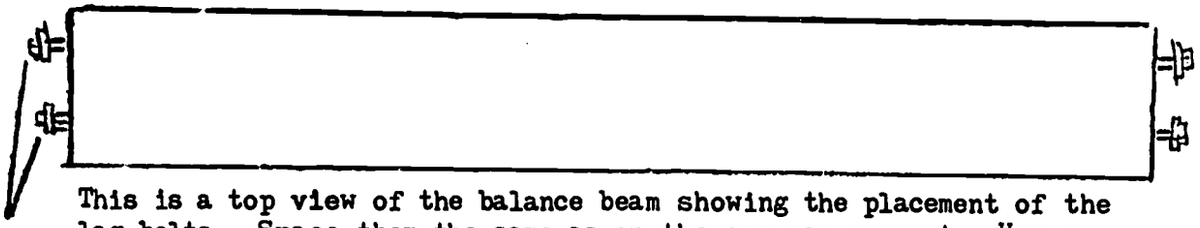


This sketch shows the placent of the dowel ladder rungs. They are placed wider at the ends to permit the children to climb through and get on the boxes. Holes for the connecting lag bolts are cut 2" down on each box. Assemble the ladder first and mark openings for the bolts after you have the bolts set. The distance will be about 16½" apart. This piece joins boxes one and two.

See-saw support showing placement of lag bolts. Place them 3" apart and equal distances from each end. Cut the holes 12" and 15" from the ground. This joins boxes three and four.

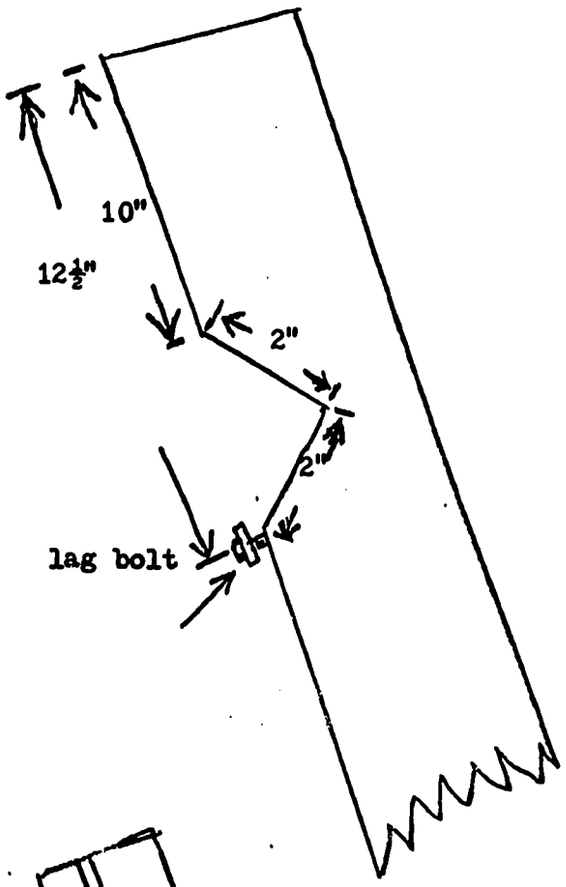


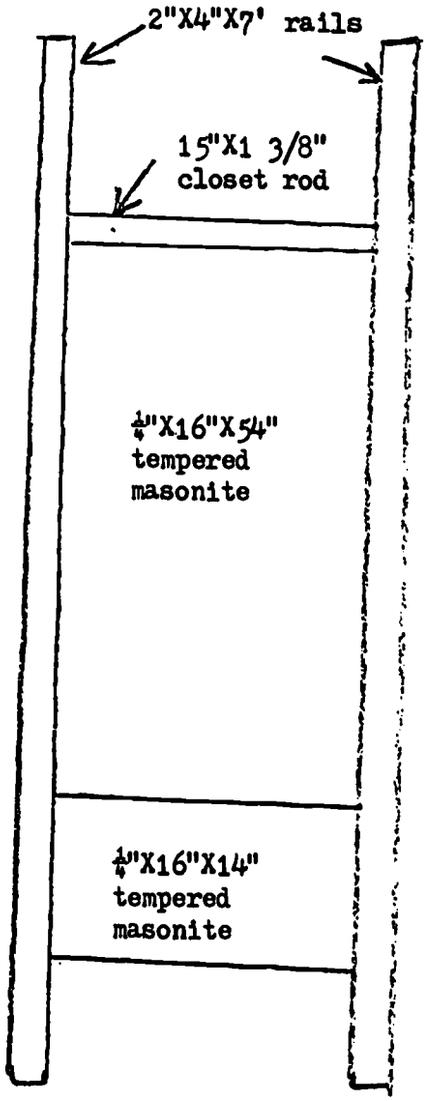
This is a view of the bottom of the see-saw board. There are two 2"X2"X5" cleats nailed 1½" from the center of the board which leaves a 3" opening. These cleats keep the board from sliding off the support. Round the corners of the board to eliminate sharpness.

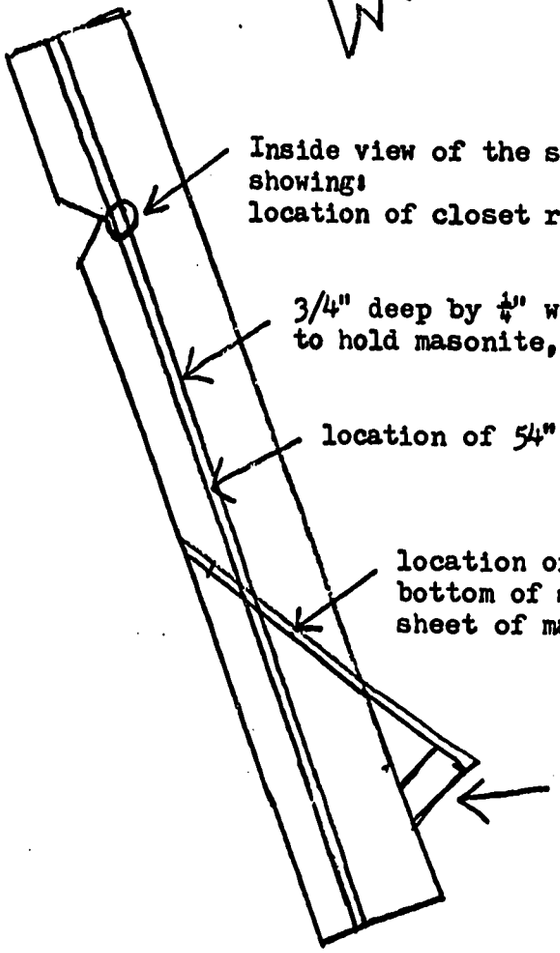


This is a top view of the balance beam showing the placement of the lag bolts. Space them the same as on the see-saw support. However, this piece is connected flat. The two holes for each end are horizontally located 15" from the ground and 3" apart.

Details of the Slide Assembly







Inside view of the side rail showing:
location of closet rod,

3/4" deep by ¼" wide groove to hold masonite,.

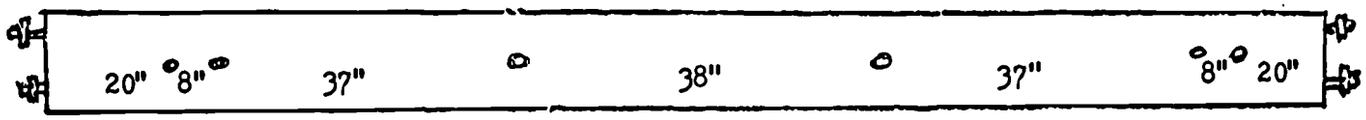
location of 54" long masonite,

location of 14" long masonite bottom of slide which has the upper sheet of masonite resting on it,

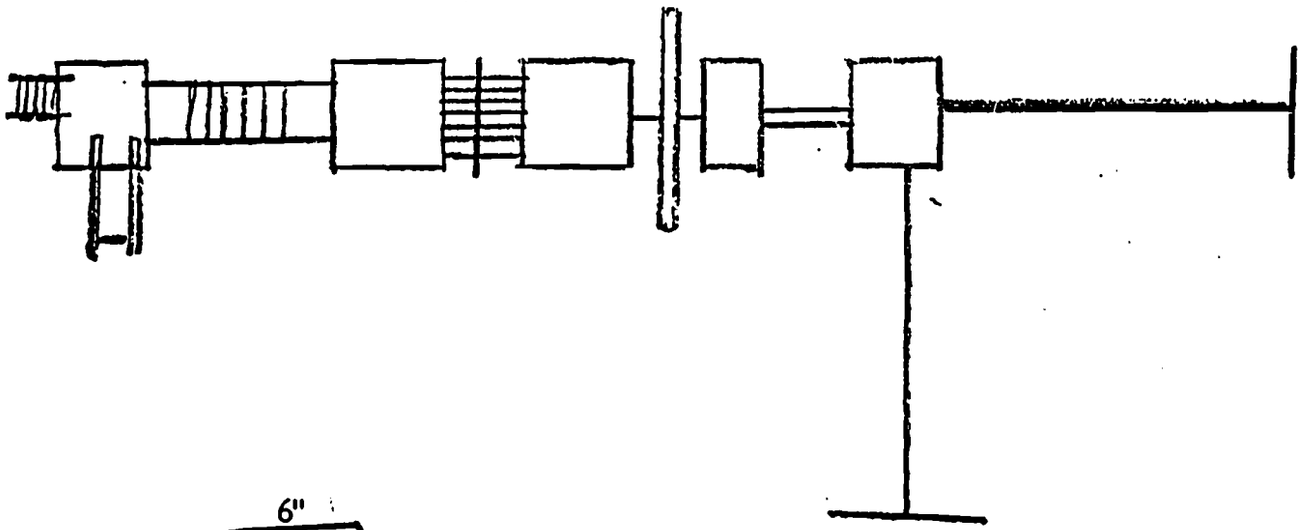
2"X4"X17" spruce cut as a support for the bottom piece of masonite.

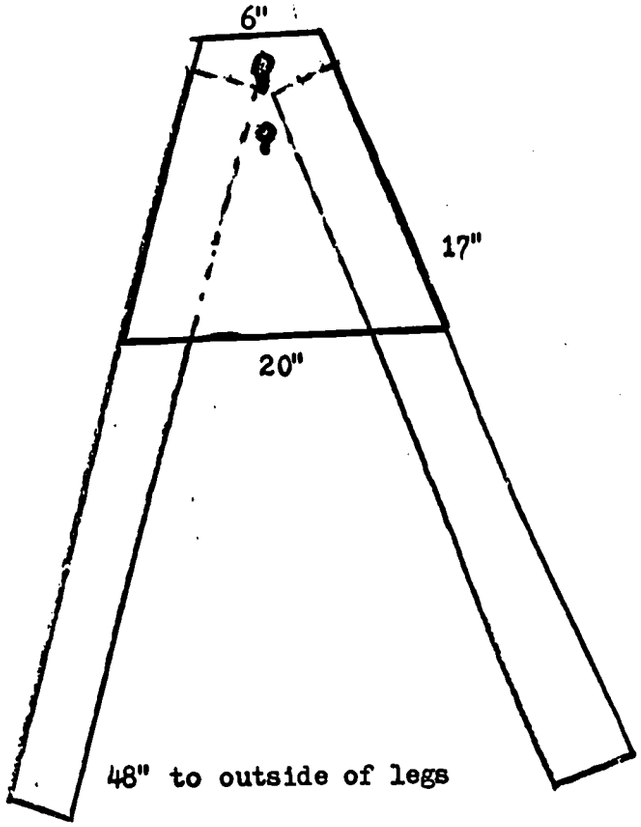
Additional Swings

The two disc swings we show in the pictures are fine for a small number of children, but they are so popular that you will need more for a full class of children. We made up the bars below to add more swing stations. The support is fourteen feet long and each holds four swings, two disc and two canvas slings. The sketch below shows the spacing of the 3/8" holes which are drilled in the beam to take the $\frac{1}{4}$" rope for swings.



This sketch is a top view of the assembled outdoor equipment showing where we added the swings. The support bars mount in holes $1\frac{1}{2}$" and 5" from the top of the last box.





The sketch at the left shows the A shaped supports which lock on to the 2"X6"X14' carrying bars. The cleats are made from the scraps of the letter or design cutouts on the boxes. You should place one on each side of the leg sets.

Materials needed:

2 - 14'X2"X6" spruce
2 - 8'X2"X4" spruce
8 - $\frac{1}{4}$"X$4\frac{1}{2}$" lag bolts with washers
50' of $\frac{1}{4}$" nylon rope
Paint, glue, nails and tools will be the same as used in the construction of the other parts.

The disc seats are 7" to 9" plywood circles cut from scrap with a 3/8" hole drilled in the center to take the rope. The sling swings are canvas tied to the ropes.

The Doll House

For interior decorating we used fabric scraps for curtains and rugs. Wallpaper samples with small patterns were glued to the inside walls. The masonite roof can be left its natural brown and waxed to prevent staining.

Fisher-Price dolls and furniture are just the right size for the house. You will need some brown enamel to create an integrated situation.

The Doll House

Material needed and approximate cost:

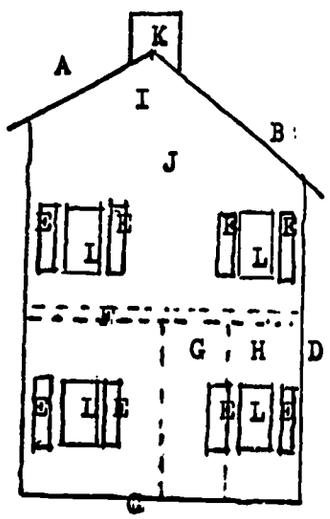
1 - 8'X1"X12" #2 pine	$2.08
1 - 24"X48"X 1/8" masonite	1.00
1 - ½ pint enamel for outside walls	1.00
1 - ½ pound 6d box nails	.15
1 - 2 ounces wood glue	$ .30
	$4.53

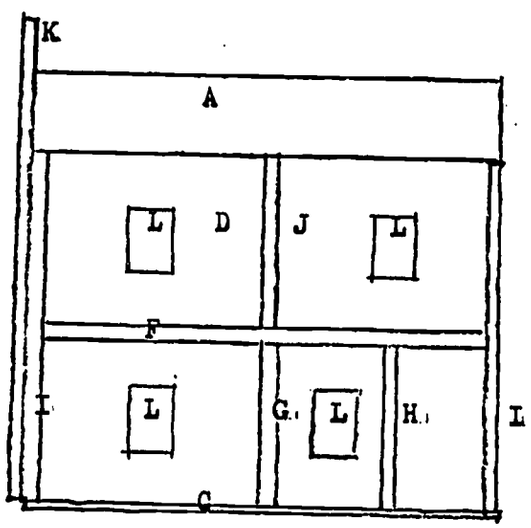
Tools needed:

hammer
saw
2" paint brush
saber saw
sandpaper
brush cleaner

Parts to be cut from above material:

1 - 6"X20½" masonite for front roof	A
1 - 9"X20½" masonite for back roof	B
1 - 11¼"X19½" masonite for bottom floor	C
1 - 14"X19½" masonite for back wall	D
20 - 1"X3" masonite for shutters	E
1 - 11¼"X18"X1" pine for second floor	F
1 - 7½"X7 3/4"X1" pine downstairs wall	G
1 - 4"X7 3/4"X1" pine for kitchen wall	H
2 - 11¼"X18½"X1" pine for end walls tapered to 16" in front and 14" in back	I
1 - 11¼"X10 3/4" tapered to 7" in front and 5" in back for upstairs wall	J
1 - 3"X20"X1" pine for chimney	K
Cut 12 windows 2"X3", four in each end and four in back	L





The Bird House

The bird house as descrubed here is used as a classroom project. With the materials listed you can make 32 birdhouses that can be pre-cut and pre-drilled. The children can then nail them together without any difficulty. There is a great amount of accomplishment felt by a pre-schooler in nailing these pieces to form a complete birdhouse. Older children might even do the entire job of cutting and nailing.

We cut all the pieces and drilled them outside of the center. We then had each child assemble their own birdhouse to take home. All of the birdhouses were not made the same day. The children did them when they wanted.

The finished houses cost about forty cents each.

The back piece is nailed flush at one end and projects at the other. The projecting piece can have two nails started so that the house can be nailed to a tree or building.

It is important that the roof project only over the front, keeping the back of the house even.

The Bird House

Material list and approximate cost:

1 - 4'X8'X¼" AC plywood	$4.00
3 - 10'X1"X6" #2 pine	4.80
2 - 12'X1"X6" #2 pine	3.84
one pound 4d box nails	$ .30
	$12.94

Tools needed:

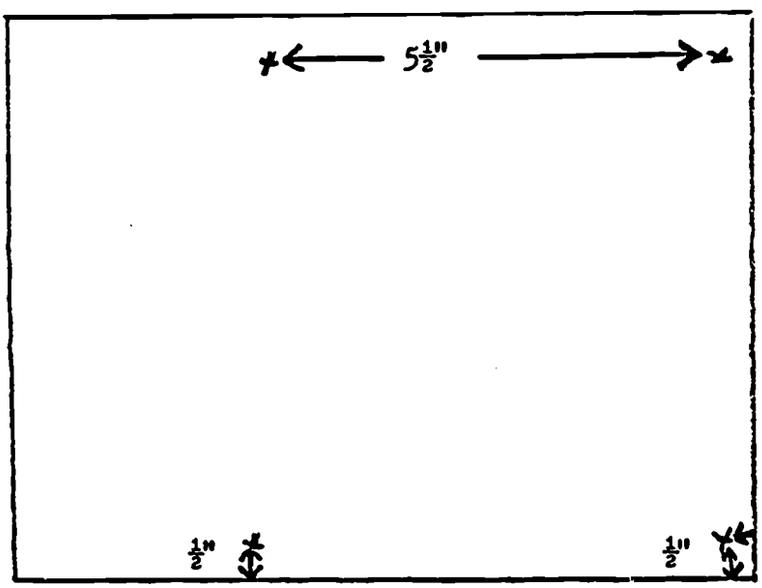
hammer
1" drill
1/8" drill
hand saw or table saw

Parts to be cut from the above material:

For each house you will need:

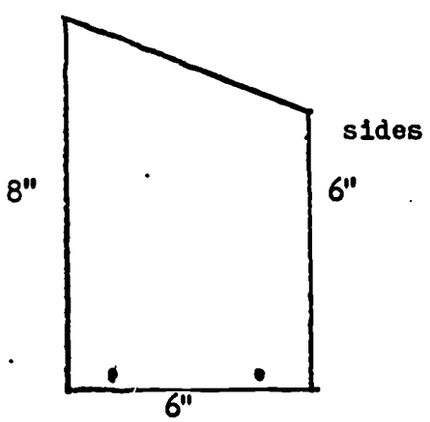
3 - 6"X8"X¼" plywood
2 - 1"X6"X8" front and 6" back #2 pine
1 - 1"X6"X4½" #2 pine

Plywood pieces showing location of 1/8" holes

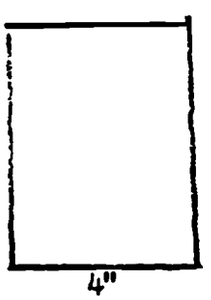


Identical pieces for front, back and roof.

Front piece has a 1" hole drilled in the center.



sides



bottom

The Tube Boat and Paddle

The tube boat is a lightweight and easy to build raft type boat that is easily transported for use in a number of different situations. It can be carried on the car roof or inside. Placed upside down inside the car it makes an excellent seat for the kids to fight over on long trips.

The tire tubes project farther than the platform which makes the boat safe to use in liner type swimming pools.

There is a great deal of variation that can be made using the basic idea of this type of construction. The tube size can be increased depending on the weight of the user. With much larger tubes the board size and rope length will have to be increased also.

The use of truck size tubes and a larger board make this a handy one person fishing boat for ponds and lakes. This is especially good when water weeds would stop a boat with more draft. With a larger boat to be used for fishing, we suggest a back rest.

Tube Boat and Paddle

Materials needed and approximate cost:

2 - 15 or 16 inch tire tubes	$4.00
12 -4d galvanized box nails	.10
1 - 18"X48"X$\frac{1}{2}$" exterior plywood	2.00
1 - 50' length light clothesline	1.00
$\frac{1}{2}$ pint enamel paint	1.00
1 - 5'X1 3/8" closet rod	1.00
1 - 16"X16"X$\frac{1}{4}$" exterior plywood	$ .50
	$9.60

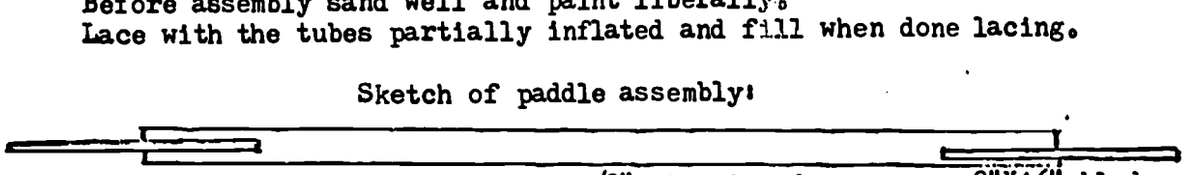
Tools needed:

saw to round corners
3/8" drill
2" paint brush
brush cleaner
sandpaper

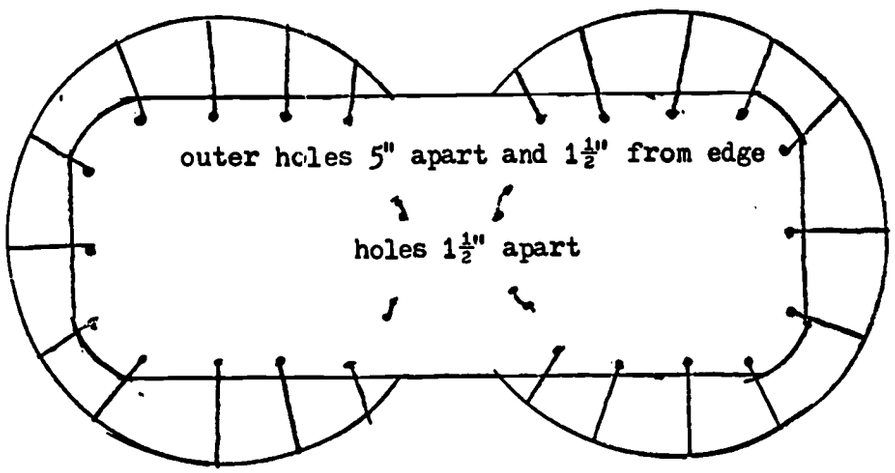
Directions:

Cut a one-quarter inch slot eight inches into the ends of the closet rod. Remember to keep the slots parallel. Insert blades and nail with three 4d nails from each side.
Round the corners of the board on about a nine inch diameter(use a dinner plate as a guide.)
Drill holes about an inch and one half from the edges and about five inches apart. At the middle drill eight holes over the centers of the tubes about 1$\frac{1}{2}$" apart.
Before assembly sand well and paint liberally.
Lace with the tubes partially inflated and fill when done lacing.

Sketch of paddle assembly:

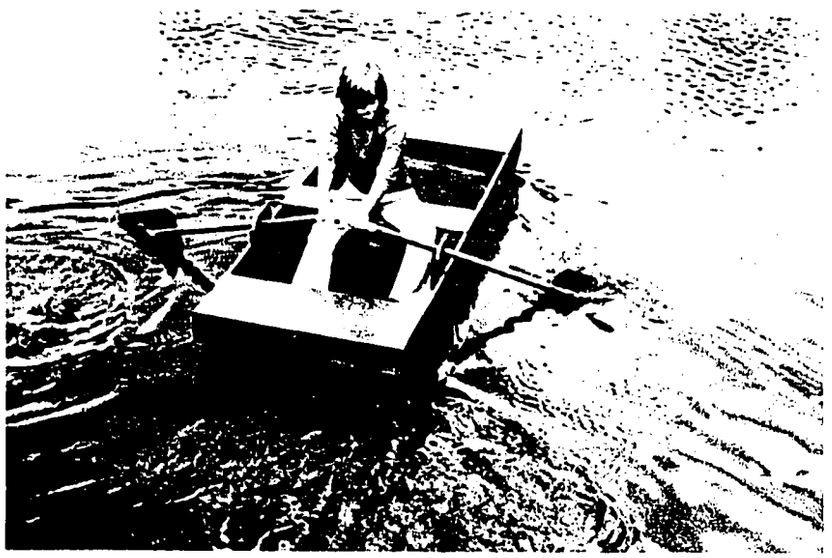


8'X16" blade five foot by 1 3/8" closet rod 8"X16" blade



The Rowboat

This is a lightweight and handy type boat that is built for durability. The one pictured will easily carry two adults and still retain its stability. The sides are ten inches which could be reduced for use by children.



The seats are completely sealed boxes which have a volume of over six cubic feet of trapped air. Even if the boat were filled with water it would still support nearly four hundred pounds. The boat is excellent for use in shallow water. As pictured here, the boat requires less than three inches of water depth.

The Rowboat

Materials needed and approximate cost:

2-14'X1"X10" #2 pine	$8.40
1-4'X8'X¼" exterior plywood	5.50
1-12'X1"X2" #2 pine	.96
1-8'X1 3/8" closet rod	1.60
1- quart enamel undercoat	3.00
1- quart enamel	3.00
1- lb. 4d cement coat box nails	.30
1- ½ lb. 6d cement coat box nails	.20
1- tube wallboard adhesive	$1.00
	$23.96

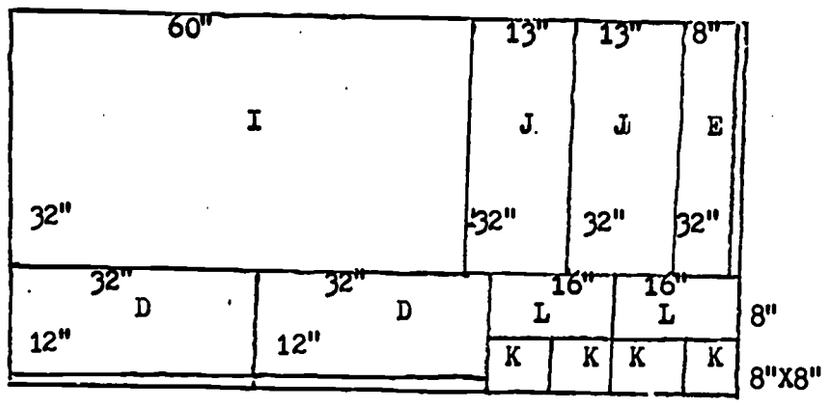
Tools needed:

cross cut saw
hammer
saber saw
plane
2" paint brush
caulking gun
ruler
sandpaper
brush cleaner

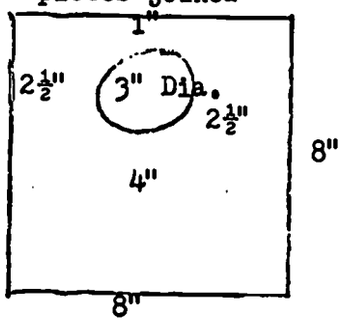
Parts to be cut from above:

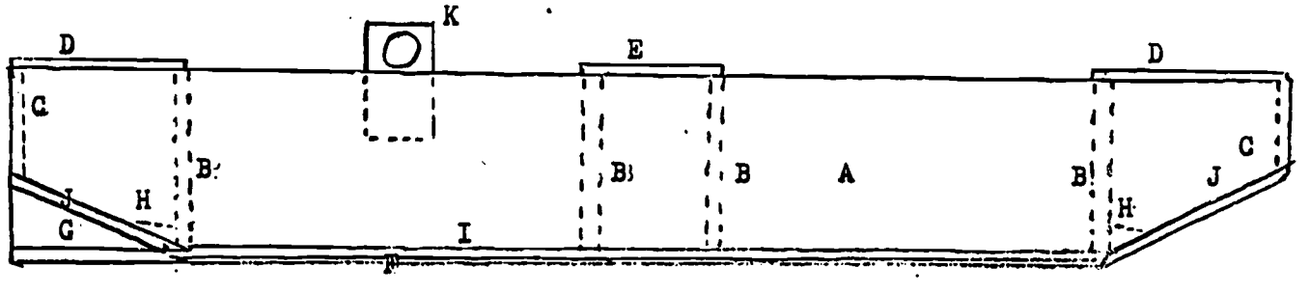
2 - 7'X1"X10" #2 pine for sides	A
4 - 30½"X1"X10" #2 pine for crosspieces	B
2 - 4 5/8"X1"X30½" #2 pine for end pieces	C
2 - 12"X32"X¼" plywood for end seats	D
1 - 8"X32"X¼" plywood for middle seat	E
1 - 6'X1"X2" #2 pine for keel	F
1 - 12"X4 5/8"X13" wedge for end of keel	G
2 - 30½"X1"X2" #2 pine for bottom nailers	H
1 - 5'X32"X¼" plywood for floor	I
2 - 13"X32"X¼" plywood for floor ends	J
4 - 8"X8"X¼" plywood for oarlocks	K
2 - 8"X16"X¼" plywood for oar blades	L
2 - 4'X1 3/8" closet rod for oar handles	M

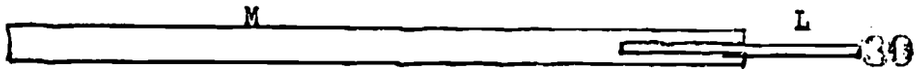
Cutting directions for plywood sheet:



Oarlocks: K
two plywood
pieces joined







Nathan, the Sock Puppet

This is a puppet that children can make quickly if they have an adult to help.

Materials needed: buttons, glue, needle and thread

Directions:

Put your hand all the way inside the sock. Separate your thumb from your other fingers, making a mitton effect.
Put the forefinger of your free hand between your thumb and fingers (outside of sock.) This makes a dent. With the first and third finger pinch the top of this dent together.
Now you or the child can make four or so stiches. This makes the nose and mouth portion of the puppet.
Let the child glue or stitch eyes on the puppet using buttons.
You're all set now to give puppet shows or just play.

Magic Markers

Empty roll on deoderant bottles can be used as magic markers. Snap off the top part which holds the roller. Rinse the bottle and fill with easel paint.

Tie Dyeing

Attractive cowboy bandannas can be easily made by children. Old bedsheets are good material to use. Diluted easel paint is used for the dye. Different shaped objects are tied into the material with string or rubber bands and then quickly dipped.

The Chair

The chair is an undeveloped idea whose inclusion was probably inspired by Carole Rogers when she described our equipment designs as traditional in her McCalls article about our first booklet.

As shown here, the chair is supported by one quarter inch nylon rope, and it is raised and lowered by a five dollar Sears boat winch. There are two pulleys lashed to a branch about one foot apart. The use of two pulleys keeps the chair from spinning. The winch will hold about forty feet of line which means that the chair can be raised about twenty feet.

An automobile starter motor could be adapted to operate the chair. You would need to add a reverse mechanism and gears to lower the speed.

In its present form the chair might interest a few hardy bird watchers. However, we predict a bright future for the person who develops the idea. Probably an iron framed canvas reclining chair would be a good form. Can you picture two people chatting in a cathedral ceilinged room while a party is going on below them?